

BARBEL *BARBUS BARBUS* IN THE RIVER CLYDE: A NEW FISH SPECIES ESTABLISHED IN SCOTLAND

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ABSTRACT

The Barbel is a new fish species to the Scottish fauna. It is believed that, following earlier attempts at introduction, adult fish were introduced to the River Clyde from England during the early 1990s and are now establishing there, with juvenile fish being caught during 2000. Although adding to the diversity of coarse fish available to Clyde anglers, the presence of the Barbel is likely to be disadvantageous to native fish there, especially Atlantic Salmon which is still re-establishing after a century's absence.

INTRODUCTION

Scotland has seen numerous introductions of alien species over the last 150 years and more than one third of the Scottish ichthyofauna is now made up of species introduced from abroad (Adams & Maitland, 2002). The most notable introduction in recent years was the Ruffe *Gymnocephalus cernuus*, which was introduced to Loch Lomond about 1980 (Maitland *et al.*, 1983; Adams & Maitland, 1998) and is now well established there and in other waters in Scotland (e.g. Loch Ken and the Forth and Clyde Canal). The latest in this series of alien fish is the Barbel *Barbus barbus*, which appears now to have become established in the River Clyde.

One of the earliest fish introductions to the River Clyde was the Grayling *Thymallus thymallus*, which was first released there in December, 1855, when three dozen fish were placed in the river near Abington. Some 150 years later, the Grayling is well established and distributed throughout most of the river (and much of Scotland from the River Tay southwards) and a species favoured by many anglers (Miller, 1987). There is every reason to expect the Barbel to do equally well in time, although its northern credentials are not as good as those of the Grayling and it may not be so favoured during cooler summers.

Judging by its favoured habitats elsewhere, the River Clyde should prove suitable for the Barbel. Like the Rivers Avon and Severn, in which it occurs in England, the Clyde is a large river, with extensive stretches of deep fast flowing water for adults, many suitable areas of gravelly shallows for spawning, and plenty of sheltered slow-flowing backwaters and still pools which are favoured by the young fish. Much of the main River Clyde and many of its main tributaries should prove suitable for this species and, as in other rivers further south into which it has been successfully introduced, the Barbel population is likely soon to expand and occupy these favoured habitats.

ORIGIN

Full details of Barbel captured so far in the River Clyde are not available, for there is no systematic programme of recording fish catches there. Moreover, some anglers are coy about discussing the new arrival. Thus, as with so many other introductions of fish to Scotland, the details of the original introduction of this species are somewhat hazy. However, from hearsay information, it seems likely that the first Barbel were probably brought up from the River Swale or the River Ure by steel workers at Motherwell who released them in the River Clyde above Motherwell. Subsequently, local reports indicate that several batches, totalling about 50 adult Barbel altogether were transported from England and placed in the River Clyde by coarse anglers during the 1990s. The origin of this stock is believed to be the River Severn.

Unlike the introduction of Ruffe *Gymnocephalus cernuus* to Loch Lomond, which is believed to have resulted from the casual dumping of live bait at the end of a fishing trip, there is little doubt that this transfer of Barbel was a deliberate attempt by anglers to establish the species in the River Clyde. The Barbel, though of no commercial importance in Great Britain is an important species to some anglers, and is respected for its cunning and fighting qualities. Maxwell (1904) noted that 'Altogether this fish is well equipped with organs of propulsion, which enable him to make a grand fight when hooked.' Regan (1911) agreed: 'The Barbel is a strong and active, yet wary, fish, and affords fine sport to the angler.'

Barbel are now caught in the River Clyde on a regular basis, and in the year 2000 the following fish were reported to the authors: (a) A 1 lb (0.45 kg) Barbel caught and returned by someone fishing for Atlantic Salmon just downstream of Blantyre. This fish is much smaller than any of those known to have been stocked and is assumed to be one of their progeny. (b) A 'large' Barbel, caught and returned just downstream of Uddingston. (c) A 13.5 lb (6.18 kg) female Barbel, 'full of spawn', taken by a salmon angler 'a few miles upstream of Motherwell'. (d) Three large Barbel, 8.25 lb (3.71 kg), 8 lb (3.6 kg) and 5 lb (2.25 kg) caught by coarse fishermen near Motherwell (see Figure 1). These fish were of sufficient interest to feature in the 'Daily Record' (1 December, 2000) as 'Fish of the Week'.

THE BARBEL

The Barbel is found in Europe from western France across central Europe to the Black Sea (Maitland, 2000). In the British Isles, it was formerly confined to the east and south-east of England but has been

Figure 1. Three fine Barbel caught on the River Clyde near Motherwell by specialist coarse anglers



re-distributed by angling interests to several southern river systems such as the Medway, the Severn and the Bristol Avon. It is absent from Ireland and was from Scotland until the last decade of the 20th century. Adult Barbel are usually some 40-60 cm in length and 1-2 kg in weight, but the

species can grow up to 100 cm in length and reach a weight of 8 kg in very favourable waters. The present British rod-caught record is for a fish of 6.237 kg caught in the River Avon in Hampshire in 1962. No Scottish record has yet been ratified.

The Barbel is characterised by the possession of two pairs of long fleshy barbels on the equally fleshy upper lip, one pair (the smaller), just in front of the snout, the other at the rear angles of the mouth. The mouth is placed ventrally back from the snout. The body, evolved for active swimming, is long and rounded with very little lateral flattening, although it is rather flat along the belly. The body is covered in medium-sized scales of which there are 55-65 along the lateral line. The Barbel is usually a brownish-green colour on the head and back which grades to a golden-brown on the sides and then to creamy white on the belly. The fins are a dull yellowish-green, sometimes with an orange tinge.

The Barbel is a bottom-living fish which occurs usually in the lowland reaches of large clean rivers, where there are stretches of clean gravel and weed beds. Spawning takes place in May and June or even into July when adult fish may move upstream and congregate in large numbers near the spawning grounds, which are over clean gravel and among open weed beds in flowing water. The eggs are yellow, 2-2.5 mm in diameter, sticky, and adhere to weed and to the gravel. Development varies with water temperature, but normally takes 10-15 days. The fry start to feed on small crustaceans and insect larvae and as they grow they move to larger invertebrates including worms, crustaceans, molluscs (both snails and mussels), and mayfly and midge larvae. Large Barbel will take small fish when they can. In good habitats the young fish may reach 10 cm after one year and 15-20 cm after two years. They mature normally at about 4-5 years of age, the males usually about a year earlier than the females and correspondingly often smaller.

DISCUSSION

Anglers who catch Barbel and are unfamiliar with the species may be in for a surprise, not to mention some potential danger! Firstly, Gordon (1920) mentions that 'It is very quick of hearing, and often makes a noise when caught, and growls under the water.' Secondly, and more seriously, though the flesh is highly regarded in some parts of Europe, the roe (and possibly even the flesh during the spawning period) is poisonous, causing severe stomach disorders. Juliana Berners (1486) gave one of the earliest warnings about eating Barbel: 'The barbyll is a swete fysshe, but it is a quasy mete, and peryllous for mannys bodye.' Evidence is given by John Hawkins who, in notes to his edition of The

Compleat Angler (Walton, 1760), recorded 'that one of his servants, who had eaten part of a Barbel, but not the roe, was seized with such a violent purging and vomiting as had like to have cost him his life.'

Regan (1911) continued with further warnings '... opinions differ as to its value as food, the flesh being white and firm, but rather coarse; the eggs are more or less poisonous, sometimes inducing violent purging and vomiting, and also weakening the heart so much that fainting may result; the poisonous secretion is sometimes absorbed by the flesh of the lower part of the fish, which may thus produce similar effects, and to be safe it is best to eat Barbel only in the late summer and autumn, and to remove the roe as soon as possible after the fish is caught.' The safest option is offered by Maxwell (1904): 'Well, and what are you to do with your Barbel when you have got him? That is just the least satisfactory part of the performance. Were Barbel a culinary prize, like Salmon, the sport would be a noble one; but most people account the fish fit for nothing better than to feed pigs withal.'

The realisation that Barbel is established in the main stem of the River Clyde follows closely on the confirmation that the North American Signal Crayfish *Pacifastacus leniusculus* is also well established in another part of the Clyde system - though this fact only recognised there relatively recently (Maitland *et al.*, 2001). This aggressive predator was first identified by the authors in the River Clyde near Elvanfoot and is now known to be common along several kilometres of the river there. Some 10,000 Signal Crayfish were taken from the river during 2000 and attempts are continuing to contain or eradicate the species. It is unlikely that these will be successful in the long-term, and more likely that it, and the Barbel, will eventually spread to many parts of the River Clyde.

Wheeler & Jordan (1990) noted that, in past translocations of Barbel in Great Britain (which have almost always used adult fish), it was normal for the acanthocephalan parasite *Pomphorhynchus laevis* to be transferred with it. Thus, though it has not yet been possible for the authors to examine any of the Scottish specimens in detail, it seems likely that this parasite has been brought into Scotland with the Barbel. Such transfers have ignored the advice that any translocations of Barbel should use parasite-free young fish from hatcheries and not the parasitised adult wild stock.

As with freshwater invertebrates (Maitland *et al.*, 2001; Maitland & Adams, 2002), this new fish species is likely to continue the scenario identified by Maitland (1987), of changing and unstable fish communities in many parts of the River Clyde. With improving water quality in the lower reaches, native species such as Atlantic Salmon *Salmo salar* and River Lamprey *Lampetra fluviatilis* are trying to make a comeback to this river after a century of absence. It is particularly unfortunate, therefore, that alien species such as Barbel and Signal Crayfish (and possibly others, as yet unidentified), likely to

act as both competitors and predators, are being introduced at this time.

Will the new population of Barbel do any significant damage to native aquatic communities in the River Clyde? This question cannot be answered with certainty. However, there is every likelihood that Barbel will compete for food and space with native fish species such as Brown Trout *Salmo trutta*. It is also likely to be a predator on the eggs and young of both Atlantic Salmon and Brown Trout, as well as other fish there. Studies on the introduced Ruffe in Loch Lomond (Adams, 1991; Adams & Maitland, 1998) have clearly shown that this one small species has caused massive ecological changes in Loch Lomond and now at least four other alien species are established there. A simpler question is easier to answer. Will the Barbel be a positive or a negative influence on the native aquatic communities of the River Clyde? Unfortunately, the answer must be negative.

Hopefully, the Barbel will be listed among those fish species to be included in forthcoming legislation on controls on the keeping or release of non-native fish in Scotland, at present being prepared by the Scottish Executive. This will parallel existing legislation in England and Wales (The Prohibition of Keeping or Release of Live Fish (Specified Species) Order 1998) and will make introductions of non-native fish to Scottish waters illegal, unless carried out under licence.

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